Claims

1. Isolated DNA comprising a DNA sequence encoding a cell receptor of a vertebrate animal, said receptor having an amino acid sequence with at least 30% identity to the amino acid sequence shown in FIG. 3.

2. The isolated DNA of claim 1, wherein said DNA sequence encodes substantially all of the amino acid sequence shown in FIG. 1 (SEQ. ID NO. 1).

3. The isolated DNA of claim 1, wherein said DNA sequence encodes substantially all of the amino acid sequence shown in FIG. 3 (SEQ. ID NO. 3).

4. The isolated DNA of claim 1, said isolated DNA being (8A6), deposited with the ATCC and designated ATCC Accession No. 68570.

5. The isolated DNA of claim 1, wherein said DNA sequence encodes substantially all of the amino acid sequence shown in Fig. 6 (SEQ. ID. NO. 4).

6. The isolated DNA of claim 1, wherein said DNA sequence hybridizes to the DNA sequence shown in Fig. 1 (SEQ. ID NO. 1).

7. The isolated DNA of claim 1, wherein said DNA sequence hybridizes to the DNA sequence shown in Fig. 3 (SEQ. ID NO. 3).

8. The isolated DNA of claim 1, wherein said DNA sequence hybridizes to the DNA sequence shown in Fig. 6 (SEQ. ID NO. 4).

9. A purified preparation of a vector, said vector comprising a DNA sequence encoding a parathyroid hormone receptor.

10. A cell containing the isolated DNA of claim 1.

11. The cell of claim 10, wherein said cell is capable of expressing said cell receptor from said isolated DNA.

12. An essentially homogenous population of cells, each of which comprises the isolated DNA of claim 1.

13. Isolated DNA comprising a DNA sequence encoding a polypeptide capable of binding parathyroid hormone or parathyroid-hormone-related protein.

14. A method for producing a polypeptide, said method comprising:

providing a cell comprising isolated DNA encoding a parathyroid hormone receptor or a fragment thereof; and

culturing said cell under conditions permitting expression of a polypeptide from said DNA.

15. A single-stranded DNA comprising a portion of a parathyroid hormone receptor gene, said portion being at least 18 nucleotides long.

16. The single-stranded DNA of claim 15, wherein said portion is less than all of said parathyroid hormone receptor gene.

17. The single-stranded DNA of claim 15, wherein said DNA is detectably labeled.

18. A single-stranded DNA comprising a portion of a parathyroid hormone receptor cDNA, said portion being at least 18 nucleotides long.

19. The single-stranded DNA of claim 18, wherein said DNA is antisense.

20. Parathyroid hormone receptor produced by expression of a recombinant DNA molecule encoding a parathyroid hormone receptor.

21. An essentially purified preparation of the parathyroid hormone receptor of claim 20.

22. An essentially purified preparation of the parathyroid receptor produced by the expression of the DNA of claim 5.

23. A polypeptide comprising at least six amino acids and less than the complete amino acid sequence of a parathyroid hormone receptor, said polypeptide capable of binding parathyroid hormone or parathyroid hormone-related protein.

24. The polypeptide of claim 23, wherein said parathyroid hormone receptor is a human parathyroid receptor.

25. The polypeptide of claim 23, wherein said fragment comprises

(a) TNETRERAVFDRLGMIYTVG,

(b) YLYSGFTLDEAERLTEEEL,

(c) VTFFLYFLATMYYWILVEG,

(d) Y-RATLANTGCWDLSSGHKKWIIQVP,

(e) PYTEYSGTLWQIQMHYEM,

(f) DDVFTKEEQIFLLHRAQA,

(g) FFRLHCTRNY,

(h) EKKYLWGFTL,

(i) VLATKLRETNAGRCDTRQQYRKLLK, or

(j) a fragment of (a) - (i) which is capable of binding parathyroid hormone or parathyroid hormone-related protein.

26. A therapeutic composition comprising, in a pharmaceutically-acceptable carrier, (a) a parathyroid hormone receptor or (b) a polypeptide comprising a fragment of said receptor.

27. An antibody capable of forming an immune complex with a parathyroid hormone receptor.

28. A therapeutic composition comprising the antibody of claim 27 and a pharmaceutically-acceptable carrier.

29. A method of reducing the level of calcium in the blood of a mammal, which method comprises administering

the therapeutic composition of claim 26 to said mammal in a dosage effective to inhibit activation by parathyroid hormone or parathyroid hormone-related protein of a parathyroid hormone receptor of said mammal.

30. A method of reducing the level of calcium in the blood of a mammal, which method comprises administering the therapeutic composition of claim 28 to said mammal in a dosage effective to inhibit activation by parathyroid hormone or parathyroid hormone-related protein of a parathyroid hormone receptor of said mammal.

31. A method for identifying a compound capable of competing with a parathyroid hormone for binding to a parathyroid hormone receptor, said method comprising:

(a) contacting the polypeptide of claim 23 with a parathyroid hormone, (i) in the presence or (ii) in the absence of a candidate compound; and

(b) comparing (i) the level of binding of said polypeptide to said parathyroid hormone in the presence of said candidate compound, with (ii) the level of binding of said polypeptide to said parathyroid hormone in the absence of said candidate compound; a lower level of binding in the presence of said candidate compound than in its absence indicating that said candidate compound is capable of competing with said parathyroid hormone for binding to said receptor.

32. A method for identifying a compound capable of competing with a parathyroid hormone-related protein for binding to a parathyroid hormone receptor, said method comprising:

(a) contacting the polypeptide of claim 23 with a parathyroid hormone-related protein, (i) in the presence or (ii) in the absence of a candidate compound; and

(b) comparing (i) the level of binding of said polypeptide to said parathyroid hormone-related protein in the presence of said candidate compound, with (ii) the level of binding of said polypeptide to said parathyroid hormone-related protein in the absence of said candidate compound; a lower level of binding in the presence of said candidate compound than in its absence indicating that said candidate compound is capable of competing with said parathyroid hormone-related protein for binding to said receptor.

33. A method for identifying a compound capable of competing with a parathyroid hormone for binding to a parathyroid hormone receptor, said method comprising:

(a) combining a parathyroid hormone with the cell of claim 11, (i) in the presence or (ii) in the absence of a candidate compound; and

(b) comparing (i) the level of binding of said receptor to said parathyroid hormone in the presence of said candidate compound, with (ii) the level of binding of said receptor to said parathyroid hormone in the absence of said candidate compound; a lower level of binding in the presence of said candidate compound than in its absence indicating that said candidate compound is capable of competing with said parathyroid hormone for binding to said receptor.

34. A compound capable of inhibiting the binding of parathyroid hormone or parathyroid hormone-related protein to a parathyroid receptor on the surface of a cell.

35. A therapeutic composition comprising the compound of claim 34 and a pharmaceutically-acceptable carrier.

36. A method for identifying a DNA sequence homologous to a parathyroid hormone receptor-encoding DNA sequence, said method comprising:

providing a genomic or cDNA library;

contacting said library with the single-stranded DNA of claim 18, under conditions permitting hybridization between said single-stranded DNA and a homologous DNA sequence in said library; and

identifying a clone from said library which hybridizes to said single-stranded DNA, said hybridization being indicative of the presence in said clone of a DNA sequence homologous to a parathyroid hormone receptor-encoding DNA sequence.

37. A transgenic non-human vertebrate animal bearing a transgene comprising a DNA sequence encoding parathyroid hormone receptor or a fragment thereof.

38. A diagnostic method comprising:

(a) obtaining a first blood sample from an animal;

(b) administering the composition of claim 35 to said animal;

(c) obtaining a second blood sample from said animal subsequent to said administration of said composition; and

(d) comparing the calcium level in said first blood sample with that in said second blood sample, a lower calcium level in said second blood sample being diagnostic for a parathyroid hormone-related condition.

39. The isolated DNA of claim 1, wherein said DNA sequence encodes a parathyroid hormone receptor.

add D

add E2

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